

## **Drycleaner Site Profiles**

### **Peerless Cleaners, --, WI**

#### **Site Description**

Peerless Cleaners is an active drycleaner that operates in a mixed commercial and residential area. A gas station had operated at the site until Peerless Cleaners was established in 1950. Peerless Cleaners used mineral spirits in the cleaning process, and stored the mineral spirits in a 500-gal underground storage tank beneath the building. Investigations revealed petroleum and/or mineral spirits contamination primarily in the soil and groundwater. The most likely source of the mineral spirits contamination appears to have resulted from overfilling the tank. The exact quantity of mineral spirits discharged is unknown, but the contamination has not spread beyond the site. The tanks containing mineral spirits and petroleum have been removed from the site.

The underlying statutory authority for the cleanup is Chapter 292 of the Wisconsin Statutes, also known as the "Spill Law." The investigation and remediation activity at the site have qualified for financial reimbursement through the Wisconsin Drycleaner Environmental Response Program.

#### **Site Hydrogeology**

**Depth to ground water:** 6-7 ft. bgs. (This is believed to be a reflection of the local water table, and not representative of the regional water table, estimated to be over 20 feet bgs.)

**Lithology/subsurface geology:** Topsoil, with gravel, grade-2.5 ft. bgs.  
Gravel, 2.5-5.5 ft. bgs.  
Silty clay, tight with sand, 5.5-10.5 ft. bgs.  
Gravel, 10.5-11.5 ft. bgs.  
Silty clay, 11.5-12 ft. bgs.  
Silty clay, pebble bearing, 12.5-17.5 ft. bgs.

**Conductivity:** 0.28 ft/day

**Gradient:** 0.033 ft/ft (at highest)

#### **Groundwater Contamination**

**Contaminants present:** perchloroethylene (PCE), trichloroethylene (TCE), 1,2 dichloroethylene (1,2-DCE)

**Highest contaminant concentrations:** 4.8 µg/L (PCE), 1.51 µg/L (TCE), 0.7 µg/L (1,2-DCE)

**Deepest significant ground-water contamination:**

About 45 ft. bgs.

**Plume size:** about 140 ft. by 100 ft. (horizontally)

**DNAPLs present:** No

### **Soil Contamination**

**Contaminants present:** PCE, Naphthalene, Ethylbenzene, Xylenes, Toluene, 1,2 Dichloroethane (1,2-DCA), Dichlorobenzenes.

**Highest contaminant concentrations:** 4,911 µg/mg (PCE), 3,194 µg/mg (Naphthalene), 2,222 µg/mg (Ethylbenzene), 1,200 µg/mg (Xylenes), 10 µg/mg (Toluene), 34 µg/mg (1,2-DCA), 7,000 µg/mg (Dichlorobenzenes)

Extent of Contamination: 400-1,200 cubic yds.

### **Description of Remediation Scenario**

#### **Technologies Used:**

Biopiles  
Soil Vapor Extraction (SVE)  
Bioremediation  
Reductive Dechlorination  
Removal

**Cleanup goals:** The remedial goals included the removal of as much of the source as possible, and to allow natural attenuation to work on the groundwater contamination to below the NR140 PAL within a reasonable period of time.

**Remediation technology or technologies used:** Excavation and removal, Biopiles, and Soil Vapor Extraction (soil)  
Reductive Dechlorination (groundwater)

**Why technology or technologies selected:** These technologies are the most effective, feasible method of contaminant containment in clay, and to inhibit migration of chlorinated compounds in groundwater.

**Final remediation design:** Contractors excavated 18 tons of soil containing elevated concentrations of chlorinated compounds and petroleum products and transported the soil off-site for landfill disposal. The landfill treated the soil using biopiles, which introduces air and organisms into the soil to induce air flow and eventual bioremediation. Contractors installed a passive SVE system to enhance removal of soil vapors from and natural degradation in the excavation, then backfilled it with pea gravel and sealed it with about 6 in. of concrete flooring. The SVE system was vented through the flooring and out of the building, and air emissions were monitored with a photoionization detector.

Monitoring wells were installed to evaluate groundwater contamination and assess whether *in situ* conditions would promote biodegradation to bring groundwater quality into compliance in a timely manner.

### **Results**

After excavation, chlorinated compound concentrations, including PCE, were non-detect. Naphthalene concentrations were 0.08-0.28 µg/kg, toluene was 0.028 µg/kg, and total xylenes were at 7.1 µg/kg.

Quarterly groundwater monitoring reports revealed a trend of increasing PCE concentrations until May 1996. PCE concentrations peaked at 4.8 µg/L, and have since decreased to 3.4 µg/L.

The tanks containing mineral spirits and petroleum have been removed from the site. Wisconsin DNR granted closure approval for both the leaking petroleum USTs and the mineral spirits contamination. Quarterly groundwater monitoring identifies PCE concentrations exceeding the WI state groundwater quality Preventive Action Limit (PAL) (NR 140 Wis. Adm. Code) of 0.5 mg/L.

### **Costs**

**Site assessment:** \$4,674.00 (soil); \$4,927.50 (groundwater)

**Design and implementation:** \$13,952.53 (soil); \$5,239.36 (includes just under two years of operation and maintenance activities)

**O&M:**

**Total costs:** \$18,072.42

### **Lessons Learned**

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### **Site Specific References**

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### **Contacts**

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## **Drycleaner Site Profiles**

### **Stannard Launderers and Dry Cleaners, --, WI**

#### **Site Description**

The Stannard Launderers and Dry Cleaners has operated in a commercial area since the 1962. Other drycleaning facilities had operated at this location prior to Stannard, since the 1930s. The facility historically used Stoddard solvents in drycleaning operations. A fuel oil tank was discovered during construction activities to expand the building. Subsequent investigations identified mineral spirits contamination in the groundwater. The exact quantity and nature of the discharge is unknown, but the likely source is the release of Stoddard solvent from leaking underground storage tanks.

The underlying statutory authority for the cleanup is Chapter 292 of the Wisconsin Statutes, also known as the "Spill Law." The investigation and remediation activity at the site have qualified for financial reimbursement through the Wisconsin Drycleaner Environmental Response Program.

#### **Site Hydrogeology**

**Depth to ground water:** 3-8 ft. bgs.

**Lithology/subsurface geology:**

Glacial till clay, grade-20 ft. bgs.

Occasional fine sand layers

Fractured dolomite/limestone bedrock, 20 ft. bgs.

**Conductivity:** 0.0003 ft/day (clay)

**Gradient:** Fairly flat (exact measurement unavailable).

#### **Groundwater Contamination**

**Contaminants present:** Trichloroethylene (TCE), vinyl chloride (VC), Stoddard Solvent, Naphthalene.

**Highest contaminant concentrations:** 3.4 µg/L (TCE), 2.3 µg/L (VC), 1,500 µg/L (Stoddard), 74 µg/L (Naphthalene).

**Deepest significant ground-water contamination:** Under investigation

**Plume size:** Under investigation

**DNAPLs present:** Not yet determined

#### **Soil Contamination**

**Contaminants present:** TCE, 1,1-dichloroethylene (1,1-DCE) 1,2-DCE, VC, Stoddard, Naphthalene

**Highest contaminant concentrations:** Not reported

### **Description of Remediation Scenario**

**Technologies Used:**

Bioremediation  
Natural Attenuation  
Removal  
Biopiles

**Cleanup goals:** The remedial goals include the removal of as much of the source as possible, particularly at hot spots. Groundwater remediation will be designed to restore groundwater quality according to the enforcement standards established NR 140 Wis. Adm. Code. However, evaluation of seasonal trends in concentration will determine whether it is appropriate to allow the groundwater to naturally attenuate. Future groundwater monitoring events will provide data for closure determination according the NR 140 regulations.

**Remediation technology or technologies used:** Natural Attenuation (groundwater)  
Biopiles, Removal and Off-site Disposal (soil)

**Why technology or technologies selected:** Contractors viewed these technologies as the most effective, feasible methods to remove the source, and to inhibit further migration of mineral spirits compounds in groundwater.

**Final remediation design:** Contractors excavated 594 tons of soil containing elevated contaminant concentrations and transported it off-site for chemical treatment and landfill disposal. The landfill treated the soil using biopiles, which introduces air and organisms into the soil to induce air flow and eventual bioremediation.

Contractors removed 8 underground storage tanks, 5 of which stored Stoddard and fuel oil, 2 that stored fuel oil only, and 1 that stored Stoddard only.

One-inch Geoprobe temporary wells were installed to evaluate groundwater. Contractors also have installed a permanent well system, including 4 monitoring wells (13 ft. bgs.) and a piezometer, to assess whether in-situ conditions would promote biodegradation and allow natural attenuation to bring groundwater into compliance within a reasonable period of time.

### **Results**

Soil removal: Contaminant concentrations for the soil disposed of it in an off-site landfill are pending. Future monitoring activity will provide information about

groundwater concentration trends.

Site investigations will continue to delineate the contaminant plume. Quarterly groundwater sampling will be conducted for a minimum of four quarters.

**Costs**

Site assessment: \$5,302.75 (soil); \$778.25 (groundwater)

Design and implementation: \$39,093.78 (soil)

O&M:

Total costs:

**Lessons Learned**

1. It is important to carefully evaluate the site to determine its eligibility for the drycleaner reimbursement fund, even in the absence of chlorinated VOC contamination. The presence of Stoddard solvent contamination was initially misleading, and the presence of underground fuel oil tanks suggested the cleanup might have been addressed under the petroleum cleanup program. Closer evaluation of the Stoddard solvent contaminants prompted further site investigations and led to the conclusion that this site was eligible for the drycleaner program.
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**Site Specific References**

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